3.1 Climate and Air Quality

This section describes the climate and existing air quality resource of the region and the applicable air regulations that would apply to the proposed action and alternatives.

3.1.1 Regulatory Background

The Federal CAA amendments of the 1990s require all states to control air pollution emission sources so that National Ambient Air Quality Standards (NAAQS) are met and maintained. The NAAQS are established by the USEPA, are outlined in 40 CFR 50, and represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. An area that does not meet the NAAQS is designated as a nonattainment area on a pollutant-by-pollutant basis. In addition to these requirements, the NPS Organic Act requires the NPS to protect the natural resources of the lands it manages from the adverse effects of air pollution.

The Clean Air Act identifies two types of national ambient air quality standards. ***Primary standards*** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The criteria for potential air quality impacts include NAAQS requirements for carbon monoxide (CO), particulate matter (PM) with an aerodynamic diameter of 10 micrograms or less (PM_{10}), PM with an aerodynamic diameter of 2.5 micrograms or less ($PM_{2.5}$), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2)/oxides of nitrogen (NO_X). Applicable federal and state criteria are presented in **Table 3.1-1**.

Table 3.1-1 National and State Ambient Air Quality Standards

		State Standards	National Standards	
Pollutant	**Averaging Time**	**Concentration**	**Primary**	**Secondary**
Ozone	8-Hour	0.08 ppm	0.08 ppm	0.08 ppm
CO	1-Hour	35 ppm	35 ppm	35 ppm
	8-Hour	9 ppm	9 ppm	9 ppm
SO_2[3]	1-hour	0.075 ppm	0.075 ppm	None
	3-Hour	0.5 ppm	None	0.5 ppm
	24-Hour	None	None	None
	Annual Average	0.030 ppm	0.030 ppm	None
NO_2	1-hour	100 ppb	100 ppb	None
	Annual Average	53 ppb	53 ppb	53 ppb
PM_{10}	24-Hour	150 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual Average[1]	50 µg/m^3	None	None
$PM_{2.5}$	24-Hour	35 µg/m^3	35 µg/m^3	35 µg/m^3
	Annual Average	12 µg/m^3	12 µg/m^3	12 µg/m^3

[1]Annual Average PM_{10} standard remains in effect in Wyoming and Nevada.

µg/m^3 = micrograms per cubic meter

In addition to the designations relative to attainment of conformance with the NAAQS, the CAA requires the USEPA to place selected areas within the U.S. into one of three categories, which are designed to limit the deterioration of air quality when it is better than the NAAQS. Class I is the most restrictive air quality category. It was created by Congress to prevent further deterioration of air quality in national parks and wilderness areas of a given size, which were in existence prior to 1977, or those additional areas that have since been designated Class I under federal regulations (40 CFR 52.21).

Federal Class I areas, which include certain national wilderness areas, national memorial parks, and national parks, are afforded the highest level of protection. The visibility program is codified at: 42 U.S.C. §§ 7491 to 7492 (CAA §§ 169A to 169B). Implementing regulations for this provision are at 40 CFR 51.300 through 40 CFR 51.309. The locations of these Federal Class I areas are depicted in relation to the Project in **Figure 3.1-1**. Ambient air criteria that apply within PSD Class I areas are more stringent than those that apply to other areas (i.e., Class II areas). In addition to more stringent ambient air increments, Class I areas also are protected by the regulation of air quality related values (AQRVs) within their borders. Federal Land Managers (FLMs) are responsible for the management of Class I areas. Haziness is characterized by an index with deciview (dv) units, which are related to the logarithm of the sum of the particulate extinction coefficient (b_{ex}) and Rayleigh scattering. A change of 1 dv is usually perceived as a small change in haziness, regardless of the initial haze level.

3.1.2 Data Sources

Data sources for Section 3.1, Climate and Air Quality include climate data from the National Oceanographic and Atmospheric Administration (NOAA) State Climatologist Programs, and Western Region Climate Center (WRCC) station climate summaries; air pollution data from USEPA Air Quality System and National Emission Inventory databases, as well as information from the states of Wyoming, Colorado, Utah, and Nevada, and Clark County, Nevada.

3.1.3 Analysis Area

The analysis area for direct air quality impacts is the area within 5 kilometers (km) of the proposed and alternative reference lines.

3.1.4 Baseline Description

3.1.4.1 Climate

The climate in the northern portions of the project is characterized as arid, with cold winters and warm summers. The climate in the central portions of the Project also is arid, and the winter temperatures are similar to those in Wyoming; however, seasonal temperatures tend to be a little warmer. Annual precipitation (rainfall and snowfall) in the northern and central region ranges from 8 inches to well over 25 inches and is highly dependent on elevation and aspect of the terrain. The climate in the southern portions of the project in Nevada is hotter and drier, with generally mild winters and annual average precipitation below 5 inches.

Representative climate summaries for various regions across the analysis are including Rawlins, Wyoming; Maybell, Colorado; Rifle, Colorado; Duchesne, Utah; Milford, Utah; Caliente, Nevada; and Las Vegas, Nevada, are presented in **Tables 3.1-2** through **3.1-8**. As an example of rainfall variability across the analysis area, 30 years of precipitation data for Ashford Canyon, in Garfield County, approximately 18 miles north of Grand Junction, Colorado, is displayed in **Figure 3.1-2**. The locations of these climate stations in relation to the Project are depicted in **Figure 3.1-1**.

Southwestern Wyoming is quite windy, and during the winter there are frequent periods when the wind reaches 30 to 40 miles per hour (mph) with gusts to 50 or 60 mph. Prevailing wind directions in the different localities vary from west-southwest through west to northwest. In many localities, winds are so strong and constant from those directions that trees show a definite lean towards the east or southeast (NOAA 1985).

Wind speeds over elevated terrain are often greater than those recorded for nearby airports or other wind monitors.

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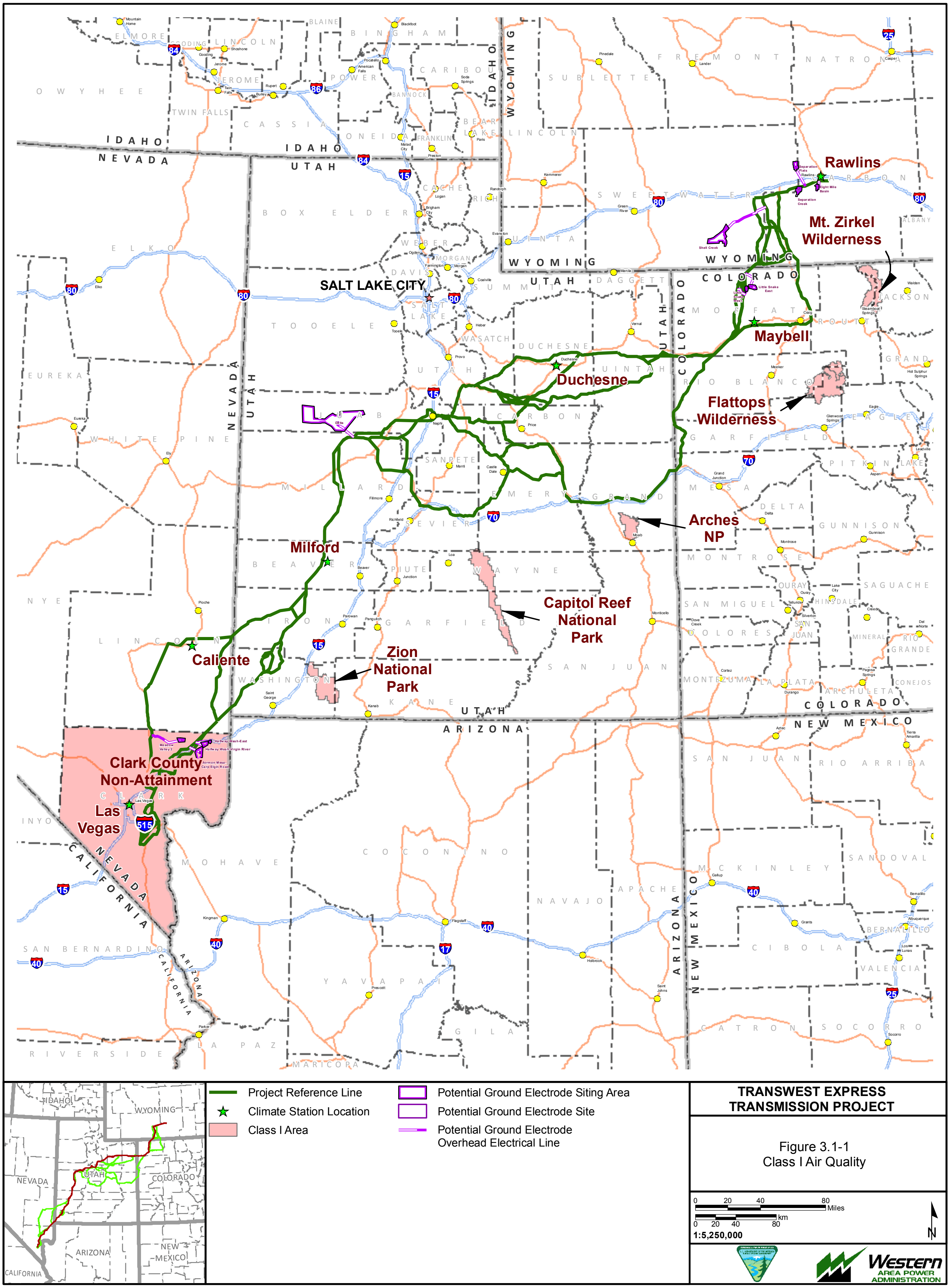


TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.1-1
Class I Air Quality

Exported On: 6/5/2013

Table 3.1-2 Monthly Climate Summary for Rawlins, Wyoming

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	30.9	12.7	0.48	7.9	2
February	33.8	14.6	0.51	7.5	2
March	41.2	20.3	0.67	7.8	1
April	52.5	27.7	1.04	7.1	0
May	63.8	36.4	1.32	1.6	0
June	75.2	44.6	0.90	0.2	0
July	83.7	51.4	0.74	0.0	0
August	81.1	50.0	0.75	0.0	0
September	70.5	40.8	0.80	1.2	0
October	57.1	31.2	0.80	3.4	0
November	40.5	20.3	0.58	7.7	1
December	32.1	14.0	0.47	7.5	1
Annual	55.2	30.3	9.05	51.9	1

Source: WRCC 2011.

Period of Record: 3/6/1951 to 12/31/2005.

Table 3.1-3 Monthly Climate Summary for Maybell, Colorado

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	32.3	1.9	0.82	12.3	6
February	37.4	7.1	0.84	10.2	5
March	47.9	17.9	1.07	8.9	2
April	29.0	25.8	1.34	4.5	0
May	69.6	33.4	1.14	0.9	0
June	79.6	40.6	0.99	0.1	0
July	87.2	47.0	0.78	0.0	0
August	84.5	45.6	0.91	0.0	0
September	74.8	36.2	1.16	0.4	0
October	62.7	25.3	1.21	1.8	0
November	45.9	15.3	1.13	9.6	1
December	34.1	4.1	1.00	13.1	4
Annual	59.6	25.0	12.38	61.8	2

Source: WRCC 2011.

Period of Record: 4/3/1958 to 12/31/2010.

Table 3.1-4 Monthly Climate Summary for Rifle, Colorado

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	36.8	9.3	0.86	11.0	4
February	43.9	16.6	0.77	7.6	3
March	53.8	24.2	0.97	3.7	0
April	64.2	31.4	1.01	0.8	0
May	74.0	38.7	1.00	0.0	0
June	84.0	45.2	0.73	0.0	0
July	90.2	52.1	1.03	0.0	0
August	87.7	50.4	1.14	0.0	0
September	79.4	41.5	1.14	0.0	0
October	67.3	31.1	1.19	0.5	0
November	51.4	21.2	0.88	3.7	0
December	39.4	12.4	0.93	11.1	2
Annual	64.3	31.2	11.61	38.5	1

Source: WRCC 2011.

Period of Record: 4/3/1958 to 12/31/2010.

Table 3.1-5 Monthly Climate Summary for Duchesne, Utah

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	31.2	4.7	0.55	6.1	2
February	37.7	11.5	0.59	5.8	2
March	50.1	22.7	0.69	3.7	0
April	61.7	30.6	0.74	1.0	0
May	71.6	38.4	0.85	0.2	0
June	80.6	45.4	0.80	0.0	0
July	87.1	52.4	0.92	0.0	0
August	84.8	50.8	1.23	0.0	0
September	76.3	41.6	1.07	0.0	0
October	63.3	31.4	0.97	0.7	0
November	46.6	19.7	0.53	2.6	0
December	33.8	9.0	0.59	5.7	1
Annual	60.4	29.8	9.51	25.7	0

Source: WRCC 2011.

Period of Record: 4/3/1906 to 12/31/2005.

Table 3.1-6 Monthly Climate Summary for Milford, Utah

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	39.1	13.6	0.65	6.8	2
February	45.6	19.6	0.77	5.7	1
March	54.6	25.3	1.04	6.7	0
April	63.9	31.6	0.87	3.2	0
May	73.8	39.3	0.72	1.0	0
June	84.5	46.9	0.46	0.0	0
July	92.1	55.8	0.71	0.0	0
August	89.7	54.1	0.86	0.0	0
September	80.7	43.8	0.70	0.2	0
October	67.8	32.6	0.91	1.1	0
November	52.5	22.2	0.65	3.6	0
December	41.3	14.9	0.71	5.8	1
Annual	65.5	33.3	9.03	34.0	0

Source: WRCC 2011.

Period of Record: 11/1/1906 to 12/31/2005.

Table 3.1-7 Monthly Climate Summary for Caliente, Nevada

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	46.6	17.8	0.82	3.5	0
February	52.4	22.9	0.94	2.6	0
March	60.6	28.3	1.01	1.2	0
April	68.8	34.3	0.70	0.2	0
May	78.6	42.0	0.52	0.0	0
June	88.5	49.5	0.34	0.0	0
July	95.4	56.6	0.77	0.0	0
August	93.1	55.3	0.88	0.0	0
September	85.2	46.1	0.62	0.0	0
October	73.4	35.1	0.78	0.1	0
November	59.1	25.1	0.68	0.7	0
December	48.3	18.9	0.66	2.9	0
Annual	70.8	36.0	8.72	11.2	0

Source: WRCC 2011.

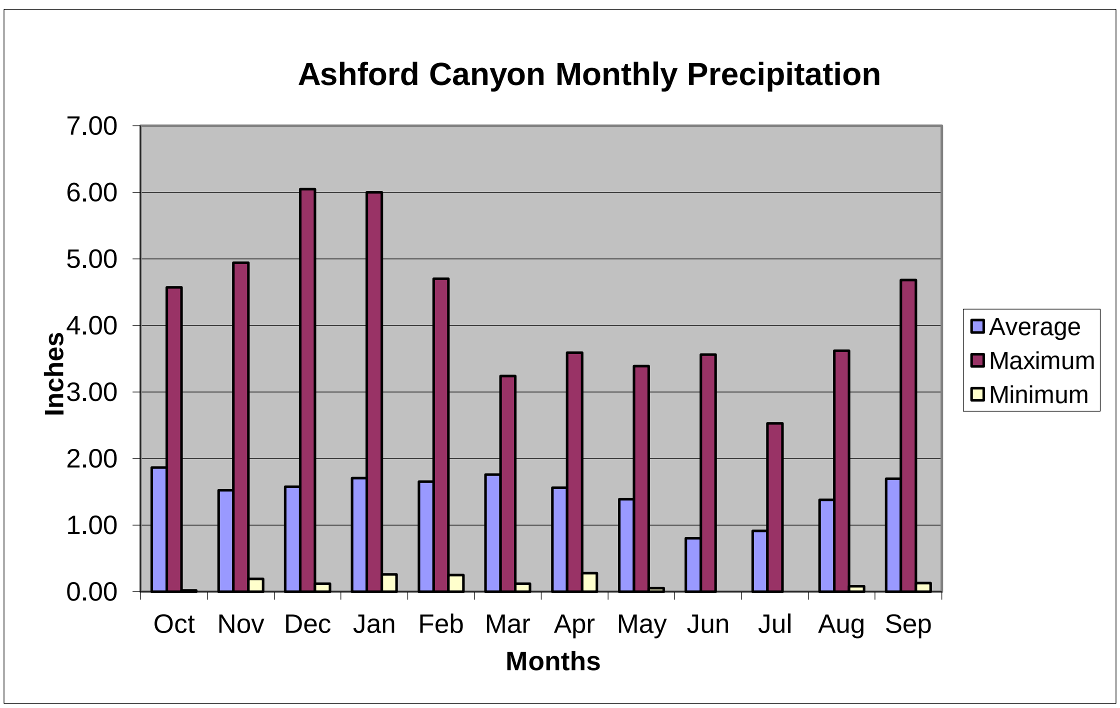
Period of Record: 4/1/1903 to 12/23/2010.

Table 3.1-8 Monthly Climate Summary for Las Vegas WSO Airport, Nevada

	Average Max. Temperature (F)	Average Min. Temperature (F)	Average Total Precipitation (in.)	Average Total Snow Fall (in.)	Average Snow Depth (in.)
January	57.1	34.5	0.52	0.7	0
February	62.5	38.9	0.58	0.0	0
March	69.4	44.3	0.44	0.0	0
April	78.2	51.7	0.20	0.0	0
May	88.4	61.1	0.15	0.0	0
June	98.6	70.0	0.07	0.0	0
July	104.6	76.7	0.43	0.0	0
August	102.2	74.9	0.43	0.0	0
September	94.7	66.6	0.31	0.0	0
October	81.3	54.4	0.26	0.0	0
November	66.5	42.1	0.36	0.1	0
December	57.3	34.9	0.41	0.1	0
Annual	80.1	54.2	4.16	0.9	0

Source: WRCC 2011.

Period of Record: 2/1/1937 to 12/23/2010.



Source: BLM GJFO

Figure 3.1-2 Ashford Canyon Monthly Precipitation for Water Years 1981 – 2011

3.1.4.2 Air Quality

Three important meteorological factors influence the dispersion of pollutants in the atmosphere: mixing height, wind (speed and direction), and stability. Mixing height is the height above ground within which rising warm air from the surface will mix by convection and turbulence. Local atmospheric conditions, terrain configuration, and source location determine dilution of pollutants in this mixed layer. Mixing heights vary diurnally with the passage of weather systems and with season. Temperature inversions, where air temperatures near the ground are colder than the temperatures above, are common in the basins and other lower elevations of the region. Inversions commonly occur in winter when snow accumulation on the ground combines with short daylight hours. In summer, inversions dissipate rapidly when early morning sunlight warms the air near the ground surface. Inversions can hinder air pollutant dispersion by preventing emissions from mixing with the ambient air in the vertical direction. On average, mean morning mixing heights in the area are approximately 1,000 feet; mean afternoon mixing heights are more than 7,800 feet (Holzworth 1972). Mean morning mixing heights tend to be lowest in fall and highest in spring.

Morning atmospheric stability conditions tend to be stable because of the cooling of the layers of air nearest the ground. Afternoon conditions, especially during the warmer months, tend to be neutral to unstable because of the rapid heating of the surface under clear skies. During the winter, periods of stable afternoon conditions may persist for several days in the absence of synoptic (continental scale) storm systems to generate higher winds with more turbulence and mixing. A high frequency of inversions at lower elevations during the winter can be attributed to the nighttime cooling and sinking air flowing from higher elevations to the low lying areas in the basins. Although winter inversions generally are quite shallow, they tend to be more stable because of reduced surface heating.

The latitude of the proposed transmission line project is within the belt of prevailing westerly winds that circle the globe around the earth's northern hemisphere. However, much of the proposed project activities would be located in complex terrain where the local winds are affected by topographic features.

Because of the typically dry atmosphere throughout these western states, bright sunny days and clear nights frequently occur. This diurnal cycle allows rapid heating of the ground surface during daylight hours and rapid cooling at night. Since heated air rises, and cooled air sinks, winds tend to blow uphill during the daytime and down slope at night. This upslope and downslope cycle generally occurs in all the geographical features, including mountain range slopes and river courses. The complexity of terrain features cause complex movements in the cyclic air patterns, with thin layers of moving air embedded within the larger scale motions. The lower level, thermally driven winds also are embedded within larger scale upper wind systems (synoptic winds). Synoptic winds in the region are predominantly west to east, are characterized by daily weather variations that enhance or diminish the boundary layer winds, and are significantly channeled by regional and local topography.

Air pollutant dispersion also is dependent on wind direction and speed. Wind direction is highly influenced by the local terrain, and will vary along the transmission line routes.

Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally expressed in units of parts per million (ppm) or $\mu g/m^3$. One measure of a pollutant is its concentration in comparison to the NAAQS and/or state ambient air quality standard, such as those established by Wyoming. These standards represent the maximum allowable atmospheric concentrations that may occur without jeopardizing public health and welfare, and include a reasonable margin of safety to protect the more sensitive individuals in the population. The State of Wyoming has adopted the NAAQS as state air quality standards and has additional AAQS for other pollutants that are more applicable to oil and gas projects (e.g., hydrogen sulfide) and are not included in this document in an effort to retain clarity. Colorado, Utah, and Nevada standards that are pertinent to the impacts from this project are the same as the NAAQS. The pollutants of interest for the proposed project are listed below.

3.1.4.3 Regional Sources of Criteria Air Pollutants

According to the USEPA Airdata website, the largest industrial sources of emissions of criteria pollutants in the analysis area include refineries and power plants. Other industrial, commercial, or government facilities in the general area also may be sources of the criteria pollutants.

Regional Air Quality

The existing air quality of most of the analysis area is typical of the largely undeveloped regions of the western U.S. Current sources of air pollutants in the region include wildland fires, mining, agriculture, industrial sources, urban transportation, rural transportation on unpaved roads, construction activities, and disturbed land. With the exception of urban transportation, which emits other air pollutants, all of these sources predominately emit PM. PM is the primary pollutant of concern in the project development area.

For the purposes of statewide regulatory planning, all of the northern portions of the analysis area have been designated by USEPA as attainment areas for all pollutants that have an AAQS; however, Clark County, Nevada, is designated as nonattainment or maintenance area for specific pollutants. This nonattainment area is depicted in relation to the Project in **Figure 3.1-2**.

Particulate Matter

Natural sources of PM are dust generated by wind across unvegetated soil surfaces and by wildland fire. Dry playa basins and areas cleared of vegetation are particularly susceptible to dust generation, particularly where soils are silty. In southern Nevada including the Las Vegas area, most PM air pollution is a result of windblown dust from disturbed ground.

The size of PM is important from a human health perspective. There are three common size classifications of PM: the largest size classification is total suspended particulate (TSP), the second largest classification is PM_{10}, and the smallest classification is $PM_{2.5}$.

The southern portion of the Project is in Clark County, where the air quality is very different from the rest of the analysis area due to the influence of the Las Vegas metropolitan area. Particulate data collected by Clark County at a site in Apex near Highway 93 and I-15 are listed in **Table 3.1-9**. The second highest 24-hour PM_{10} concentrations measured at USEPA monitoring stations in Clark County have exceeded 150 µg/m^3, which is above both National and State of Nevada AAQS. This has caused Hydrographic Basin 212 (all of Clark County) to be designated as a nonattainment area for PM_{10} (see **Appendix E** for additional information regarding attainment designations).

Table 3.1-9 Intersection of Highway 93 and I-15 Apex, Nevada PM_{10} Concentrations 2002-2007

Year	24-hour PM_{10} (µg/m^3)			Annual PM_{10} (µg/m^3)
	Maximum	Day Maximum Recorded	Second Highest	
2002	465[1]	04/15/02	176	26.4
2003	348[1]	10/30/03	105	23.8
2004	150	05/10/04	85	19.1
2005	97	05/16/05	72	18.9
2006	152[1]	09/15/06	97	17.7
2007	255[1]	06/05/07	96	23.2

[1]Includes exceptional events.

Source: USEPA 2008a.

USEPA made the determination that the Las Vegas Valley is in attainment with the PM_{10} NAAQS on August 3, 2010 (75 FR 45485), and will re-designate the area to attainment upon approval of the pending maintenance plan and request for re-designation that was submitted to USEPA in August 2012. Average annual PM_{10} concentrations in this region generally range from 20 to 30 µg/m^3, which is below the 50 µg/m^3 State of Nevada AAQS (USEPA 2008a).

Maximum measured values of 24-hour PM_{10} shown in **Tables 3.1-9** include exceptional events such as wildfires and dust storms. The frequency and severity of exceptional events can be an indicator of regional dust storm activity. In Clark County, Nevada exceptional events occurred 4 times in a 6 year period from 2002-2007, as shown in **Table 3.1-9**.

Ozone

Monitoring results in Las Vegas Valley (HB 212) in Clark County have exceeded the current 8-hour ozone standard. In 2004, the USEPA designated hydrographic basins 164A, 164B, 165, 166, 167, 212, 213, 214, 216, 217, and 218 as nonattainment for the 8-hour ozone standard.

In March 2004, Nevada submitted an 11-factor analysis indicating that the Las Vegas nonattainment area was much smaller than the presumptive area and that the smaller area proposed was consistent with the definition of nonattainment in section 107(d)(1) of the Clean Air Act. The USEPA concurred with this smaller boundary, and excluded the Las Vegas Paiute Tribal Community and the Moapa Band of Paiute Tribal Land and other tribal lands within Clark County, Nevada. The State recommended nonattainment areas include all violating air monitors in the Las Vegas area. The Joe Neal (elementary school) site had a design value of 86 parts per billion (ppb) for 2001 to 2003, just 1 ppb greater than the trigger for nonattainment designation, 85 ppb. On March 29, 2011 (76 FR 17343), the USEPA re-designated Clark County as attaining the standard for ozone. In April, 2011, Clark County submitted to the USEPA an Ozone Re-designation Request, along with a maintenance plan for a formal re-designation from nonattainment to attainment for the 1997 8-hour ozone NAAQS. On November 13, 2012, USEPA published the proposed rule for Approval of the Maintenance Plan and Re-designation of Clark County for the 1997 8-Hour Ozone Standard.

Carbon Monoxide

In 2000, the Clark County, Department of Air Quality submitted to the USEPA a CO State Implementation Plan (SIP), describing control measures and technologies to bring Las Vegas into compliance with the CO NAAQS.

Prevention of Significant Deterioration

The closest Class I areas to project alternative routes are Zion National Park (20 miles to the east), Arches National Park (10 miles to the south), Flat Tops Wilderness (30 miles south), and Mount Zirkel Wilderness (50 miles east) (**Figure 3-1.1**). Areas outside of the designated Class I boundaries are designated as Class II areas, which are allowed a relatively greater deterioration of air quality, although it must still be maintained below NAAQS. Dinosaur National Monument and Lake Mead NRA are Class II areas. No Class III areas have been designated in the U.S.

Regional Air Quality Related Values

AQRVs include changes in visibility or atmospheric deposition of pollutants to soils and waterbodies. Regional haze is visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area. Visibility impairment is caused by particles and gases in the atmosphere. Some particles and gases scatter light while others absorb light. The primary cause of regional haze in many parts of the country is light scattering resulting from fine particles (i.e., $PM_{2.5}$) in the atmosphere. Additionally, coarse particles between 2.5 and 10 microns in diameter can contribute to light extinction. Coarse particulates and $PM_{2.5}$ can be naturally occurring or the result of human activity.

The natural levels of these species result in some level of visibility impairment, in the absence of any human influences, and will vary with season, daily meteorology, and geography (Malm 1999).

The total nitrogen deposition trend is relatively stable at around 2.0 kilograms per hectare (approximately 40 percent from dry deposition and the remaining 60 percent from wet deposition). The total sulfur deposition trend is relatively stable, perhaps decreasing slightly over the last 10 years, and is approximately 0.7 kilograms per hectare (approximately 30 percent from dry deposition and the remaining 70 percent from wet deposition) (CASTNet 2010).

3.1.4.4 Visibility

The smallest dv values, or best visibility, are in a broad region including the Great Basin, most of the Colorado Plateau, and portions of the central Rockies, which have visibility impairment of less than 8 dv (Hand 2011). The annual mean dv reported from the IMPROVE network has shown an improvement from the baseline years of 2000-2004 in the vicinity of the proposed project. All IMPROVE monitors in Utah, Colorado, and Wyoming have shown this trend (Hand et al. 2011).

3.1.5 Regional Summary

Table 3.1-10 is a summary of air quality conditions and visibility concerns by Project region.

Table 3.1-10 Air Quality and Visibility by Region

	Exceedances of Air Quality Standards					Visibility
	NO_2	**O_3**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**Class I Areas**
Region I	No	No	No	No	No	No
Region II	No	Yes[1]	No	No	No	No
Region III	No	No	No	No	No	No
Region IV	No	Yes	No	Yes	No	No

[1] Winter ozone exceedances of NAAQS were recorded in the Uintah Basin during the winter 2010-2011. Area is designated un-classifiable and is treated as attainment.

3.1.5.1 Region I

Air quality monitoring data show that air quality in Region I is considered to be in compliance with state and Federal ambient air quality standards. Past exceedances of the PM_{10} NAAQS in the region are associated with exceptional events (USEPA 2012a).

3.1.5.2 Region II

Air quality monitoring data show that air quality in northwestern Colorado and northeastern Utah is considered to be in compliance with state and Federal ambient air quality standards. There were ozone exceedances recorded in the Uintah Basin during the winter of 2010-2011; however, the region remains designated as un-classifiable and is treated as in attainment (USEPA 2012b). There were no ozone exceedances in the Uintah Basin during the winter of 2011 through 2012. The Proposed Route and Alternatives are near Dinosaur National Monument, which is classified under PSD as a Class II sensitive area, and Arches and Capitol Reef national parks, which are Class I. Flat Tops Wilderness, located about 40 miles south of the easternmost alternative, and Mount Zirkel Wilderness, located about 50 miles east of the easternmost Alternative route are PSD Class I areas.

3.1.5.3 Region III

Air quality monitoring data show that air quality in southwestern Utah is considered to be in compliance with state and Federal ambient air quality standards. The Proposed Route through southwest Utah passes within about 20 miles of Zion National Park, which is classified under PSD as a Class I area.

3.1.5.4 Region IV

Much of the southern portion of the Project is located in Clark County, where the air quality is considered to be nonattainment for ozone (8-hour) and PM_{10} (24-hour). The Moapa River Indian Reservation and the Fort Mojave Indian Reservation in Clark County are excluded from the ozone nonattainment area. As of September 27, 2010, Clark County has been re-designated to a maintenance area for CO. The nonattainment status of Clark County requires a conformity demonstration that is discussed in Section 3.1.6.

3.1.5.5 Global Changes

Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these greenhouse gas emissions and net losses of biological carbon sinks (e.g., vegetation) could cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space (Intergovernmental Panel on Climate Change [IPCC] 2007).

Global climate model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes (IPCC 2007). Warming during the winter months is expected to be greater than increases in daily maximum temperatures. Increases in temperatures would increase water vapor in the atmosphere and reduce soil moisture, increasing generalized drought conditions, while at the same time enhancing heavy storm events. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict.

As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate change science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documented trends (USEPA 2008b).

Several activities contribute to the phenomena of climate change, including emissions of greenhouse gases (especially carbon dioxide [CO_2] and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and surface reflectivity (i.e., albedo). It is important to note that greenhouse gases will have a sustained climatic impact over different temporal scales. For example, recent emissions of CO_2 can influence climate for hundreds of years.

Emissions of CO_2 from fossil fuel use and from the effects of land use change on plant and soil carbon are the primary sources of increased atmospheric CO_2. Since 1750, it is estimated that about two-thirds of anthropogenic CO_2 emissions have come from fossil fuel burning and about one-third from land use change. For the southwestern U.S. subregion, it is estimated that the present emissions rate of CO_2 equivalents (CO_2e) (a way of expressing all the different greenhouse gases as a single number) for power generation is 1,258 lb/megawatt hours (MWh) (**Table 3.1-11**). This is compared to the NWPP of 863 lb/MWh, where much of the electrical generation comes from renewable sources, primarily hydroelectric. On average, each MWh of electricity from wind and solar energy delivered to the Las Vegas area will avoid emissions from fossil fuel burning by over 1,000 lb/MWh.

Table 3.1-11 CO_2e Emission Rates for the Southwestern and Northwestern U.S. Subregions

Subregion	Name	Location	Emissions CO_2 (tons)	Emissions Rate (lb/MWh)	Emissions CH_4 (tons)	Emissions rate CH_4 (lb/MWh)	Emissions N_2O (tons)	Emissions rate N_2O (lb/MWh)	Emissions CO_2e (tons)	Emissions rate CO_2e (lb/MWh)
AZNM	WECC	Southwest	113,156,263	1,253	3,396,787	19	2,993,639	17	113,656,000	1,258
NWPP	WECC	Northwest	115,898,956	859	4,410,058	16	3,682,826	14	116,516,100	863

Source: Year 2007 eGRID Subregion Emissions – GHG (eGRID2010 Version 1.1 Created May 2011).

3.1.6 Impacts to Air Quality

Impacts to air quality include increases in criteria pollutants including fugitive dust emissions, emissions of hazardous air pollutants and greenhouse gas (GHG) emissions. Local effects are analyzed within 5 km of the project boundaries; cumulative effects are analyzed within 100 km of project boundaries. Generally, minor surface-based particulate emissions have maximum impact levels within 500 m of the source, and do not have noticeable effects (i.e., greater than 1 $\mu g/m^3$) in areas beyond 5 km. Visibility impacts to Class I areas are analyzed at much greater distances. **Table 3.1-12** lists the relevant management considerations for air quality.

Table 3.1-12 Relevant Management Considerations for Air Quality

Resource Topic	Management Considerations
NAAQS	Compliance with NAAQS and state standards
Visibility	Federal guidelines for visibility impairment
Atmospheric Deposition	Federal guidelines for atmospheric deposition
GHG	Climate Change

<u>Issues</u>

- Air pollutants emitted from the tailpipes of construction equipment, including criteria pollutants and greenhouse gas emissions;
- Fugitive dust generated during construction and facility maintenance;
- Windblown dust generated due to wind erosion of disturbed surfaces;
- Impairment of visibility conditions in Class I areas (e.g., Zion and Arches national parks); and
- Conformity requirements in nonattainment areas.

<u>Assumptions</u>

Assumptions regarding compliance with regulatory requirements, detailed project operations, inputs for emission factors, and future conditions are required to estimate impacts to air quality and climate.

Key assumptions regarding compliance with regulatory requirements include:

- All state and local air quality construction permits will be received prior to initiation of project construction;
- Dust control plans will be prepared and submitted as required by the responsible agencies; and

- Any operating permits or dust control plans required in nonattainment areas will address conformity requirements or demonstrate that total emissions in nonattainment areas will be below applicable thresholds.

Methodology for Analysis

Project construction air quality emissions and impacts are similar within each Region, and can be classified as consisting of area and point sources. Emissions from construction activities are classified as area sources, would be confined to the daytime hours, and would occur only during active construction periods. Such emissions are transitory, moving with the construction progress, and temporary, not occurring in one area for a long duration. Point sources are identified as the portable concrete batch plants.

For the estimation of air quality related impacts, the methodology depends on the activity (construction equipment, windblown dust, etc.) and the type of air impacts (criteria emissions, greenhouse gases, etc.). The activity/air impact combinations are grouped together based on the issues identified above. The calculation methodology for each activity affecting air quality is described below.

Tailpipe Emissions from Construction Equipment and Facility Maintenance

Tailpipe emissions from construction are based on equipment-specific emission factors, the equipment type, the number of each type of equipment, and estimated hours of operation. Equipment-specific emission factors are from the California Environmental Quality Act, Air Quality Handbook (South Coast Air Quality Management District 2010). The hours of operation were calculated based on assumptions regarding typical construction activities.

Tailpipe emissions from maintenance vehicles are calculated the same as for construction equipment. Emissions are based on the emission factors for light-duty passenger vehicles (South Coast Air Quality Management District 2010) and the calculated maintenance trips.

The proposed construction equipment is comprised primarily of heavy-duty, non-road mobile equipment powered by diesel fuel. Only pickup trucks will operate on gasoline rather than diesel fuel. Emissions from diesel engines would be minimized because engines must be built to meet the standards for mobile sources established by the USEPA mobile source emissions regulations (40 CFR Part 85). In addition, the USEPA is requiring that the maximum sulfur content of diesel fuel for highway vehicles be reduced from 500 ppm by weight (ppmw) to 15 ppmw, making ultra low sulfur diesel available nationwide.

- For tailpipe emissions from construction equipment, assumptions include:
  - All construction equipment, except for pickup trucks, will consume ultra low sulfur diesel fuel. Pickup trucks are assumed to be equivalent to light-duty, gasoline powered, passenger vehicles.
  - Construction activities will occur for 12 hours per day, 6 days a week.
  - Not all pieces of construction equipment will operate simultaneously. At any given time, roughly a third of the equipment will be operating; thus, it is assumed that each piece of equipment operates 4 hours out of a 12-hour construction day. This is a conservative approach since a particular piece of equipment, such as a crane, has a very specific function and must remain on-site to perform this function, but this function is not required to occur continuously.
  - Pickup trucks used for transporting crews and other local trips, will make two trips per hour on average over a 12-hour work day (24 trips per day). Each trip is assumed to be 4 miles on average.

   - Emission factors for year 2012 are used since this is predicted to be the first year of construction. Future years are anticipated to have lower emission rates due to federal and state emission reduction programs for mobile equipment.

Fugitive Dust Emissions from Construction Equipment and Facility Maintenance

Fugitive dust is lofted into the air by construction equipment during many types of activities: driving over unpaved surfaces, excavation of topsoil and rock, and transfer of excavated material from one place to another. The USEPA has developed a generic emission factor of 1.2 tons per acre per month for fugitive dust that includes all construction activities (USEPA 1995). The emission calculations for fugitive dust associated with construction activities are based on the estimated acres of land actively undergoing construction and emission factors for heavy construction operations from the USEPA (USEPA 1995). The estimate of area actively constructed on any given day includes the north and south terminals, transmission line, temporary construction staging areas, and access roads. However, all this area is not undergoing construction simultaneously; for the purposes of project emission calculations, it is estimated that approximately 5 percent of the regional acreage (roughly 2,040 acres per region) per day are under active construction. Fugitive dust emissions during construction will be controlled as specified in the required dust control plan. For the purposes of emission calculations, the estimated fugitive dust emissions are assumed to be reduced by 50 percent through use of appropriate control measures.

Localized air quality emissions at a given location are expected to occur during construction activities. Emissions from construction equipment will be controlled by following state and local regulations. Actual construction control measures are part of a Construction Plan and a Dust Control Plan. In addition, operating permits for stationary sources, such as batch plants and operating permits for larger combustion sources, such as engines greater than 250 horsepower, will be obtained prior to construction activities. The development of a Construction Traffic Management Plan with measures to reduce the number of construction trips also will reduce air emissions from construction transportation vehicles.

- For fugitive dust from construction and maintenance, assumptions include:
   - For north and south terminal facilities, 3.25 acres are actively being constructed per day. This is a conservative assumption for the purposes of estimating the maximum daily emissions of fugitive dust from construction equipment;
   - For the purposes of estimating the PM_{10} emissions associated with construction fugitive dust, it is assumed that 75 percent of the fugitive dust is in the PM_{10} size range (USEPA 1998). Similarly, the USEPA recommends that 10 percent of the PM_{10} is in the $PM_{2.5}$ size range (WRAP 2006);
   - Site grading is the primary general construction activity that would produce fugitive emissions;
   - A control efficiency of 50 percent is assumed for purposes of emission calculations. Controls will be described in the dust control plan; and
   - Facilities will be regularly maintained and a light-duty truck will travel the length of the transmission line once per month.

<u>Best Management Practices</u>

The following BMPs are included in the project plan:

The applicant shall cover construction materials and stockpiled soils if these are sources of fugitive dust.

- To minimize fugitive dust generation, the applicant shall water land before and during surface clearing or excavation activities. Areas where blasting would occur should be covered with mats (AIR-2);

- Dust abatement techniques (e.g., water spraying) shall be used by the applicant on unpaved, un-vegetated surfaces to minimize airborne dust. Water for dust abatement should be obtained and used by the applicant under the appropriate state water use permitting system. Used oil will not be used for dust abatement (AIR-3);
- Predict future impacts from externally initiated actions prior to approval of those actions. Comply with all applicable local, state, and federal regulations to limit air quality degradation;
- Reduce vehicle speeds on native surfaced roads (e.g. 15 mph)
- Restrict surface disturbing activities to periods when wind speeds are less than 25 mph.
- To minimize fugitive dust, the applicant shall cover, at all times when in motion, open bodied trucks, transporting materials likely to give rise to airborne dust; and
- Access roads and on-site roads should be surfaced with aggregate, wherever appropriate.

Applicant Committed Design Features include:

- The Construction, Operation, and Maintenance (COM) Plan will include a Dust Control and Air Quality Plan. Requirements of those entities having jurisdiction over air quality matters will be adhered to and dust control measures will be developed (TWE-47);
- Open burning of construction trash will not be allowed unless permitted by appropriate authorities (TWE-47); and
- The Contractor and Subcontractor(s) will be required to have and use air emissions control devices on construction machinery, as required by federal, state or local regulations or ordinances (TWE-48).

Greenhouse Gas Emissions

Construction of the project would result in gaseous emissions, including CO_2e from fuel combustion in construction vehicles.

Annual construction engine emissions of GHGs (CO_2e, which include CO_2, methane, and N_2O) from construction engine sources are less than 800 tpy for all alternatives. The total GHG emissions from construction would be negligible in terms of impacts to climate change. In the final regulation on greenhouse gas permitting, the USEPA considers a source that emits more than 100,000 tpy of CO_2e to be a major source and requires a stationary source that emits more than 25,000 tpy to report their emissions. An equivalency calculation indicates that the total CO_2e emissions from construction would release about the same amount of CO_2e as the annual energy use for 52 average households in the U.S.

There would be maintenance activities during operations at the terminals and along the transmission line resulting in fuel usage from mostly light duty vehicles. Assuming that the transmission line is used primarily to carry renewable energy, direct air emissions would be offset by reductions in gaseous emissions from existing fossil-fuel fired power plants that would produce less electricity or those fossil-fueled power plants that would not be constructed in the future to meet electrical demand.

Any potential savings in GHG emissions is based on the assumption that the transmission line would primarily transmit renewable energy that would replace energy demands that would otherwise be met by non-renewable power sources. However, if this transmission line ends up transmitting more electricity from non-renewable sources, the calculated decrease would not be realized.

Decommissioning of the project would result in gaseous emissions, including CO_2e; however, emissions would be less than those associated with construction of the project.

Criteria Pollutant Air Emissions – Area Sources

Construction emissions would occur during construction of all alternatives including the north and south terminals, ground electrode facilities, access roads, preparation of transmission structure sites, erecting those structures, and construction of the transmission line. Fugitive dust results from the use of earth-moving equipment, including loaders, scrapers, bulldozers, shovels, and backhoes.

Tailpipe emissions also would occur from mobile sources including earth-moving equipment such as scrapers, loaders, bulldozers, and backhoes during construction of access roads and preparation of structure sites as well as from pickup trucks and semi-tractor trailers used to transport crews and materials. Structure components and transmission line equipment, as well as electrical cable and other equipment and supplies would be delivered by large trucks and semi-tractors. Large cranes are used to install structures. Emissions from these activities include fugitive dust and tailpipe emission (CO, NO_X, volatile organic compounds [VOCs], particulates, SO_2, and air toxics).

Approximately 10,024 acres would be disturbed during the construction phase of TransWest's Proposed Action (Alternative A) distributed across the regions. Construction and reclamation activities are expected to take place over a span of about 2 years. Fugitive dust from construction activities and travel on project roads would be controlled by water trucks. An approximate conservative emission factor for uncontrolled particulate emissions from construction activity operations is 1.2 tons/acre/month of activity. This value is most useful for developing estimates of overall emissions from construction scattered throughout a large geographical area (USEPA 1995).

Fugitive dust emissions from disturbed areas assume 12 months of construction each year and 50 percent dust controls with water applied twice a day as needed. Construction would contribute to fugitive dust emissions and include personnel vehicle access, occasional road maintenance activities, and ongoing reclamation/re-vegetation activities.

Conclusions

- Assuming that the transmission line would carry 80 percent renewable energy, there would be a net production and transmission of about 16,000 GWh of power on an annual basis without the burning of fossil fuels. The USEPA GHG Equivalencies Calculator indicates that this is equivalent to CO_2e emissions of 12.2×10^6 tons per year. This is about the same as the electricity use of 1.4 million homes for 1 year.
- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the northern terminal would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.
- Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Clark County nonattainment area would be below the conformity thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.
- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the southern terminal would not cause state or federal air quality standards to be exceeded, based on a conservative screening level air quality analysis.

Criteria Pollutant Emissions – Point Sources

Project construction air quality emissions and impacts are similar within each Region, and can be classified as consisting of point and area sources. The point sources for this project are the portable concrete batch plants that will be temporarily located approximately every 15 miles along the transmission line. Area sources are mobile sources, roadways, bulldozers, tractors, construction traffic, and other sources that cause emissions of air pollutants not situated at a fixed location.

Concrete for use in the structure foundations would be dispensed from portable concrete batch plants generally located at staging areas. Equipment typically required at a batch plant site includes generators, concrete trucks, front-end loaders, skid loaders, dump trucks, transport trucks and trailers, water tanks, concrete storage tanks, scales, and job site trailers. Rubber-tired trucks and flatbed trailers would be used to assist in relocating the portable plant along the transmission line. Commercial ready-mix concrete might be used when access to structure construction sites is economically feasible. Batch plant sites, although temporary in nature, would be fenced.

Concrete batch plants are proposed to provide concrete for the foundation for each structure. Highest annual emissions from concrete batch plants for all alternatives are shown in **Table 3.1-13**.

Table 3.1-13 Annual Point Source Emissions from Concrete Batch Plants (tons/year)

Pollutant	Highest
CO[1]	1.20
VOCs[1]	0.44
NO_X[1]	5.60
SO_2[1]	0.38
PM_{10}	5.2
$PM_{2.5}$	1.5

[1] Engine Emissions.

Calculations provided in **Appendix E**, **Table E-11**.

It is assumed that:

- Batch plants would be staged approximately every 15 miles along the transmission line route and produce concrete over the construction period. Emission factors are from USEPA AP-42, Volume 1, 5th Edition Chapter 11.12, Table 11.12-2 for Concrete Batching. Batch plant emissions PM_{10} and $PM_{2.5}$ data include total engine and batch emissions.
- The concrete batch plants would require air permits from state air permitting agencies. The air permit would provide enforceable limits and potential air pollution mitigation measures to reduce air emissions impacts from operation of the batch plants.

Screen3 Modeling Results

Screening dispersion modeling was performed to assess PM_{10} and $PM_{2.5}$ impacts of fugitive dust from disturbed acres during construction. Air modeling was performed using the USEPA-approved SCREEN3 model. SCREEN3 is a single source Gaussian plume model, which provides maximum ground-level concentrations for point, area, flare, and volume sources. SCREEN3 is a screening version of the Industrial Source Complex model. For this study, SCREEN3 model version 96043 was used to evaluate impacts from fugitive dust. The construction area was modeled as an area source using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Impacts were assessed at a distance of 50 meters from the disturbance that is representative of all such activities in the direct impacts assessment area. Results of the conservative screening level dispersion modeling analysis that are applicable throughout the entire Proposed Project for all Alternatives are shown in **Table 3.1-14** and indicate that the impacts due to fugitive dust emissions from disturbed acres are well within the National and State AAQS. Background levels shown in **Tables 3.1-14** and **3.1-15** are representative of the rural background levels for the pollutants throughout the region including the locations for the proposed transmission line and all Alternatives.

Table 3.1-14 SCREEN3 Model Results for Construction Fugitive Dust

Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hour	0.8	10.2	11.0	150	7
	Annual	0.2	9	9.2	50	18
$PM_{2.5}$	24-hour	0.2	6.9	7.1	35	20
	Annual	0.1	2.6	2.7	12	22.5

Table 3.1-15 SCREEN3 Model Results for Heavy Duty Vehicles on Unpaved Roads

Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
NO_2	1-hour	1.9	NA	1.9	188	1.0
	Annual	0.1	NA	0.1	100	0.1
CO	1-hour	0.9	NA	0.9	40,000	<0.1
	8-hour	0.6	NA	0.6	10,000	<0.1
SO_2	1-hour	0.1	NA	0.1	196	0.1
	3-hour	0.1	NA	0.1	700	<0.1
	24-hour	0.0	NA	0.0	365	<0.1
	Annual	0.0	NA	0.0	80	<0.1
PM_{10}	24-hour	39.9	10.2	50.1	150	33.4
	Annual	4.0	9	13.0	50	25.9
$PM_{2.5}$	24-hour	4.0	6.9	10.9	35	31.2
	Annual	0.4	2.6	3.0	12	25

Screening dispersion modeling also was performed to assess impacts of criteria pollutants from heavy and light duty truck emissions. Air modeling was performed using USEPA approved SCREEN3. The trucks were modeled as volume sources using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Gaseous pollutant emissions from light and heavy duty vehicles are much less than particulate emissions when vehicles are traveling on unpaved roads. Background concentrations of gaseous pollutants in rural settings are typically not available, since monitoring generally takes place where there are larger or more abundant sources of these pollutants. Impacts were assessed at a distance of 10 meters from the road for a generic road segment that is representative of all dirt roads throughout the analysis area. Results of the conservative screening level dispersion modeling analysis for heavy duty vehicles are shown in **Table 3.1-15** and indicate that the impacts from unpaved road traffic are well within the National and State AAQS. Impacts due to light duty vehicles (pickup trucks) on unpaved roads would be much less than impacts for the larger trucks.

Hazardous Air Pollutants Impacts

The regulated hazardous air pollutants (HAPs) listed in Section 112 of the CAA that would be emitted from construction activities are benzene, toluene, xylenes, acetaldehyde, formaldehyde, and propylene. Emissions of the remaining HAPs are orders of magnitude smaller. **Table 3.1-16** provides an estimate of emissions of HAPs in pounds per year for the range of transmission line alternatives.

Table 3.1-16 Principal Hazardous Air Pollutant (lbs/yr)

Pollutant	Low	High
Benzene	8.45	10.20
Toluene	3.70	4.48
Xylenes	2.58	3.12
Acetaldehyde	6.95	8.40
Formaldehyde	10.70	12.90
Propylene	23.40	28.30

HAPs are regulated by emissions only, and they do not approach the level of concern which is 10 tpy for individual HAPs or 25 tpy in aggregate. HAPs modeling was not performed for this project since the primary sources of HAPs are internal combustion engines used to power construction equipment and vehicles.

Impacts at Class I and II Areas – Acid Deposition

The proposed project would emit low levels of NO_X and SO_2, which are the potential acid producing pollutants emitted from mobile sources during construction and operation. However, by providing a conduit and contributing a portion of the power from renewable sources (i.e. solar and wind power) to the southwest region, the net impact of the project would be to improve atmospheric conditions since the generation of electricity from renewable sources would avoid the use of electricity generated in fossil fuel-fired power plants and their associated acid-producing pollutants.

Impacts at Class I and II Areas – Visibility

Background visibility data are available from Zion National Park and Arches National Park, and visibility is considered to be very good. Although construction of the proposed project would emit low levels of pollutants, principally PM_{10} and $PM_{2.5}$, as well as tailpipe emissions from mobile sources, the net impact of the project would be negligible as discussed below.

The FLMs have visibility protection responsibility under 40 CFR §51.307 (New Source Review), which spells out the requirements for SIP visibility protection programs, as well as 40 CFR §52.27 (Protection of visibility from sources in attainment areas) and 40 CFR §52.28 (Protection of visibility from sources in nonattainment areas). These three provisions, taken together along with the SIP-approved rules, establish the visibility protection program for new and modified sources throughout the country.

Section 165 (42 U.S.C. 7475) of the CAA requires the USEPA, or the State/local permitting authority, to notify the FLM if emissions from a proposed project may impact a Class I area. The permitting authority should forward PSD applications to the FLM for review and analysis as soon as possible after receipt, giving the FLM an opportunity to review the application concurrently with the permitting authority. TransWest's Proposed Action (Alternative A), and the other regional alternatives do not constitute a major PSD source and do not require notification to the FLM. Nonetheless, an assessment of visibility impacts has been made using FLAG screening level criteria.

The Agencies are using a fixed Q/D factor of 10 as a screening criteria for sources located greater than 50 km from a Class I area, where Q is the total emissions of certain pollutants in tons per year and D is the distance from the facility to the Class I area. Furthermore, the Agencies are expanding the screening criteria to include all AQRVs, not just visibility. Therefore, the Agencies will consider a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tons per year, based on

24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. The Agencies would not request any further Class I AQRV impact analyses from such sources. (FLAG 2010)

For purposes of this analysis, it is assumed that no concrete batch plants would be located within 50 km of any Class I areas. Total emissions from a concrete batch plant more than 50 km from any Class I areas added to construction emissions in the immediate vicinity would total far less than 500 tpy and thus would result in a Q/D ratio of less than 10 and satisfy the screening criteria for all AQRVs.

Impacts on Ambient Ozone Levels

TransWest's Proposed Action is unlikely to cause or contribute to the formation of regional ozone at detectable levels due to the low level of emissions of potential ozone forming compounds, including NO_X and VOCs.

Operation Impacts

Routine line maintenance and repairs during operation of the transmission line would result in negligible air emissions.

Decommission Impacts

Decommissioning of the transmission line would require removal of buildings and other infrastructure and would take place over a shorter period of time compared to construction. As a result, air emissions during decommissioning would be less than construction emissions, which are not expected to cause state or federal air quality standards to be exceeded.

3.1.6.1 Impacts from Terminal Construction and Operation

Terminals and Ground Electrode Sites

Particulate emissions from construction activities at the Northern and Southern terminals are shown in **Table 3.1-17**. Estimated criteria pollutant emission from construction activities at the Northern and Southern terminals are shown in **Table 3.1-18**. These values are representative regardless of the emission location; the proposed action would include terminals and ground electrode systems in Wyoming and Nevada, Design Option 2 would include terminals and ground electrode systems in Wyoming and Utah, and Design Option 3 would include facilities in Wyoming, Utah, and Nevada.

Table 3.1-17 Particulate Emissions from Construction of Northern and Southern Terminals and Ground Electrode Beds

Site	Initial Disturbance (acres)			PM_{10} Emissions (tons)			$PM_{2.5}$ Emissions (tons)		
	Site-specific	Corridor	Total	Site-specific	Corridor	Total	Site-specific	Corridor	Total
Northern Terminal Area	190.0	313.0	503.0	5.7	9.4	15.1	0.6	0.9	1.5
Southern Terminal Area	140.0	269.0	409.0	4.2	8.1	12.3	0.4	0.8	1.2
Northern Electrode Bed	160.0	90.0	250.0	4.8	2.7	7.5	0.5	0.3	0.8
Southern Electrode Bed	160.0	90.0	250.0	4.8	2.7	7.5	0.5	0.3	0.8

Calculations provided in **Appendix E**, **Tables E-9** and **E-10**.

Table 3.1-18 Mobile Source Emissions of Criteria Pollutants from Construction of Terminals and Ground Electrode Beds

Location	Pollutant (tons)					
	CO	NO_X	SO_2	VOC	PM_{10}	$PM_{2.5}$
Northern Terminal and Electrode Bed	0.63	2.94	0.19	0.23	0.21	0.21
Southern Terminal and Electrode Bed	1.14	5.29	0.35	0.42	0.38	0.38

Calculations provided in **Appendix E**, **Tables E-9** and **E-10**.

General Conformity Analysis for Clark County

The Southern Terminal would be located in Clark County, Nevada, under the proposed action or Design Option 3. Portions of Clark County, Nevada, are designated nonattainment or maintenance for one or more federally regulated pollutants. Portions of Clark County are either designated as nonattainment or maintenance for CO, PM_{10}, and ozone.

A federal agency must make a determination that permitting or approving an activity will conform to the state implementation plan in accordance with 40 CFR Part 93.150. A conformity determination is required for each pollutant when the total of direct and indirect emissions caused by a federal action in a non-attainment area would equal or exceed threshold quantities specified in 40 CFR Parts 93.153(b) (1) and (2). The applicable conformity thresholds for the Project area are as follows:

- NSR – 100 tons per year for nitrogen oxides, carbon monoxide, volatile organic compounds, sulfur oxides, and particulate matter with a diameter of less than 10 microns (NO_X, CO, VOC, SO_X, and PM_{10}, respectively).
- PSD – 250 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.
- Title V – 100 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.
- Conformity Thresholds – 100 tons per year for NO_X, CO, VOC, SO_X, and PM_{10}.

Since the project is predicted to emit all of these emissions (or precursors in the case of ozone), a conformity review was conducted based on USDOE guidance (USDOE 2000). To conduct the conformity review, the impact of the project ROW construction and facility maintenance activities was assessed in the nonattainment areas. The nonattainment area is a small subset of the whole project area. Emissions in the nonattainment area were calculated using the methodology described above for tailpipe emission and fugitive dust emissions, except calculations were limited to the nonattainment area. Estimated emissions were compared with the emissions threshold for conformity determinations as published by USDOE (2000).

Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Las Vegas nonattainment area as shown in **Tables 3.1-14** and **3.1-15** would be below the conformity thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.

Key Parameter Summary

- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the northern terminal, substations, and ground electrode facilities would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.
- Based upon the use of conservative emissions estimates, the emissions from the construction and operation of TWE in the Las Vegas nonattainment area would be below the conformity

thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.

- Equipment tailpipe emissions, and fugitive dust emissions predicted during the construction of the southern terminal would not cause state or federal air quality standards to be exceeded, based on a screening level air quality analysis.

Mitigation

No additional mitigation measures beyond the BMPs and Applicant Committed Design Features are anticipated for construction of the north and south terminal areas.

Operations

Routine vegetation maintenance, repairs and line maintenance during operation of the terminals would result in negligible air emissions.

Decommissioning

Decommissioning of the terminals would require removal of buildings and other infrastructure and would take place over a brief period of time. Air emissions during decommissioning would be less than construction emissions, and are not expected to cause state or federal air quality standards to be exceeded.

3.1.6.2 Impacts Common to All Alternative Routes and Associated Components

Air quality impacts from area sources during construction and operations of the transmission line are listed in **Table 3.1-19**. In general, area source impacts are caused by construction activities that disturb soils and release fugitive dust as well as tailpipe emissions from light pickups, heavy trucks, and construction equipment. Such impacts are transitory and temporary, and do not pose a threat to national or state AAQS. Alternative A is the shortest overall route and disturbs the fewest acres; therefore, it has less potential to impact air quality from area sources than the other alternatives. The point sources are portable concrete batch plants used to prepare material for tower foundations. Shorter transmission line routes would be expected to result in fewer towers requiring less concrete for tower bases, but only if the terrain and underlying soil structures are similar. Nevertheless, there is no appreciable difference in air quality impacts from point sources between the alternatives in each of the regions.

Table 3.1-19 Fugitive Dust Emissions from Construction by Region and Alternative

Region	PM_{10} (tpy)						$PM_{2.5}$ (tpy)					
	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
I	119.2	121.2	143.1	130.6	NA	NA	11.9	12.1	14.3	13.1	NA	NA
II	205.6	272.4	282.4	210.2	212.9	211.0	20.6	27.2	28.2	21.0	21.3	21.1
III	119.4	117.1	128.7	NA	NA	NA	11.9	11.7	12.9	NA	NA	NA
IV	44.4	47.2	49.4	NA	NA	NA	4.4	4.7	4.9	NA	NA	NA
Total	488.5	557.8	603.6	340.9	212.9	211.0	48.9	55.8	60.4	34.1	21.3	21.1

Calculations provided in **Appendix E**, **Table E-2**.

Discrepancies in totals due to rounding error.

Mitigation

No additional mitigation measures beyond the BMPs and Applicant Committed Design Features are anticipated for construction in Region I.

AQ-1*: In Region II, the Alternative B transmission line route passes within about 10 miles of Arches National Park. No concrete batch plants would be located within 30 miles of Arches National Park; therefore, concrete required for structure foundations should be acquired from local sources in the vicinity of Moab.*

Effectiveness: Location of batch plants at 30 miles or more from Class I boundaries would avoid project contributions to air quality related value reductions in these Class I areas.

AQ-2*: In Region III, the Proposed Action (Alternative A) passes within about 20 miles of Zion National Park. No concrete batch plants would be located within 30 miles of Zion National Park; therefore, concrete required for structure foundations should be acquired from local sources in the vicinity of Cedar City or St. George, Utah.*

Effectiveness: Location of batch plants at 30 miles or more from Class I boundaries would avoid project contributions to air quality related value reductions in these Class I areas.

AQ-3*: The Clark County nonattainment area is located in both Region III and Region IV. No new concrete batch plants are to be located within the nonattainment area; concrete required for structure foundations and other construction are to be acquired from existing local vendors.*

Effectiveness: Use of local concrete sources would avoid project contributions to nonattainment conditions in the Las Vegas region.

Key Parameter Summary and Conclusion

The following statements are derived from the analysis presented for various air quality factors. At the present time, there is no known phase or activity proposed to be conducted during the Project that is not consistent with current air quality regulations in Wyoming, Colorado, Utah, or Nevada.

Neither the construction nor operations phase of the proposed action or alternatives is expected to:

- Cause or contribute to any violation of any state or federal ambient air quality standard;
- Interfere with the maintenance or attainment of any state or federal ambient air quality standard in the analysis area;
- Increase the frequency or severity of any existing violations of any state or federal ambient air quality standard in the analysis area;
- Delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the USEPA or state air quality agency;
- Cause any adverse impacts to AQRVs;
- Cause any adverse impact to AQRVs in a federal Class I area; or
- Exceed state or federal general conformity thresholds.

Construction GHG emissions are expected to be both temporary and negligible when compared to the preliminary statewide GHG inventories. Operations GHG emissions would be negligible.

Estimated project emissions for point sources and areas sources for the proposed project including the alternatives and alternative variations in each of the regions are listed in more detail in **Appendix E**.

3.1.6.3 Residual Impacts

There would be no residual impacts to air quality from the proposed project because reclamation and revegetation would stabilize exposed soil and control fugitive dust emissions. As vegetation becomes established, particulate levels would return to typical conditions of the surrounding environment.

3.1.6.4 Impacts to Air from the No Action Alternative

There would be no project specific air quality impacts from the No Action Alternative since there would be no project sources of emissions. No action would mean that valuable renewable resources would not be tapped to replace power generation from fossil fuel-fired generation facilities, and GHG emissions on the order of 12 million tons of CO_2e per year would potentially not be avoided.

3.1.6.5 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible impacts to air quality. However, there would be an irretrievable localized impact to air quality from fugitive dust emissions and equipment emissions during construction and before reclamation and revegetation is completed.

3.1.6.6 Relationship Between Local Short-term Uses and Long-term Productivity

The short-term uses associated with project construction and installation and would not substantively impact the long-term air quality in the analysis area.